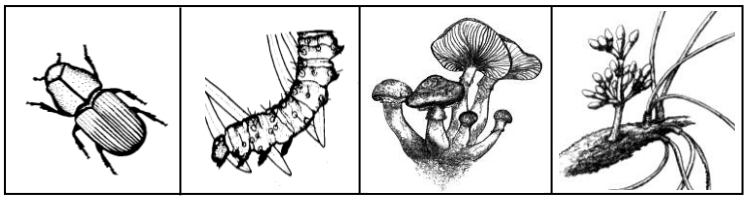
Forest Health Protection



12-05 June 2012

2011 NORTH IDAHO DOUGLAS-FIR TUSSOCK MOTH TRAPPING SYSTEM REPORT

Lee Pederson, Entomologist,
Doug Wulff, Biological Science Technician
USDA Forest Service, Northern Region, Coeur d'Alene

Introduction

The Douglas-fir tussock moth (DFTM) Early Warning System (EWS) uses a series of permanent pheromone trap sites to identify increasing populations prior to undesirable tree defoliation, a system modified after Daterman et al. (1979). The trapping system is designed to detect DFTM population changes over large geographic areas, and to give land mangers advance warning of an impending outbreak. However, the system *is not designed nor intended* to predict exactly where DFTM defoliation will occur (Sheehan and Ragenovich 2003).

Forest Health Protection (FHP), Coeur d'Alene field office maintains EWS trapping sites from Potlatch to Lucille, Idaho (Appendix 1). These trapping sites are within the federal land boundaries of the Clearwater National Forest (NF), Nez Perce NF, Bureau of Land Management (BLM) lands, and the Nez Perce Indian Reservation (IR). These sites have been selected on the basis of the impact of potential DFTM defoliation on management objectives and historical DFTM outbreaks. In addition to traps deployed on Forest Service and BLM lands, FHP installs a small number of traps on adjoining State and private lands. This adjustment was made due to the harvesting of host trees on the original trapping sites on Federal lands. The trapping sites of Junction (site 4-3), No Name (site 4-7), and Cpt. John Creek (site 4-4) are located on lands managed by the Idaho Department of lands (IDL), while Keuterville (site 3-1) and Cottonwood Butte (site 3-2) are on private lands. All trapping sites and legal descriptions can be found in Appendix 2.

IDL maintains a network of trap sites from Coeur d'Alene south to Moscow and east to Harvard, Idaho. IDL is currently monitoring a DFTM outbreak that has caused tens of thousands of acres of defoliation on State and private lands since 2010. To obtain more information on the outbreak, including annual Douglas-fir Pheromone Trapping Reports, please refer to the following URL:

http://www.idl.idaho.gov/bureau/ForestAssist/forest_health/dftm2011.html

Methods

Five pheromone-baited sticky traps are installed at each trapping site to monitor the flight of male moths. They are placed in a transect with a minimum spacing of 75 ft. between traps. An average trap catch of 25 or more moths per trap is the threshold used to indicate where defoliation may occur the following year. Follow-up sampling may be then conducted in these areas to locate potentially injurious population densities (Daterman et al. 1979).

Where trap counts have reached the average site threshold, egg mass sampling should be conducted in the fall and larval sampling should be conducted in the spring of the following year. Larval sampling may also be conducted at sites with historic tussock moth problems before counts reach an average of 25 moths per trap.

2011 DFTM Adult Trapping Results and Defoliation

A total of 1,218 moths were captured in 32 monitored trapping sites. Results show an overall means trap capture of 7.6 moths per trap, which is a considerable increase from 1.1 moths per trap in 2010 (Figure 1, Appendix 3). Little Bald Mountain (site 7-2) on the Clearwater NF, and Pine Knob (site 1-3) on the Nez Perce NF are two trapping sites that had captures ≥ than an average of 25 or more moths per trap.

In 2010, aerial detection survey (ADS) showed no DFTM-caused defoliation on Forest Service, BLM, or tribal lands that fall within the Federal lands trapping system area. An estimated 45,200 acres of outbreak defoliation were recorded in 2011 (Figure 1), which occurred on the Clearwater and Nez Perce NFs. Most of the recorded defoliation was on the Nez Perce NF.

The EWS showed only slight increases in trap catches prior to defoliation and trap catches from this year's outbreak (Figure 1).

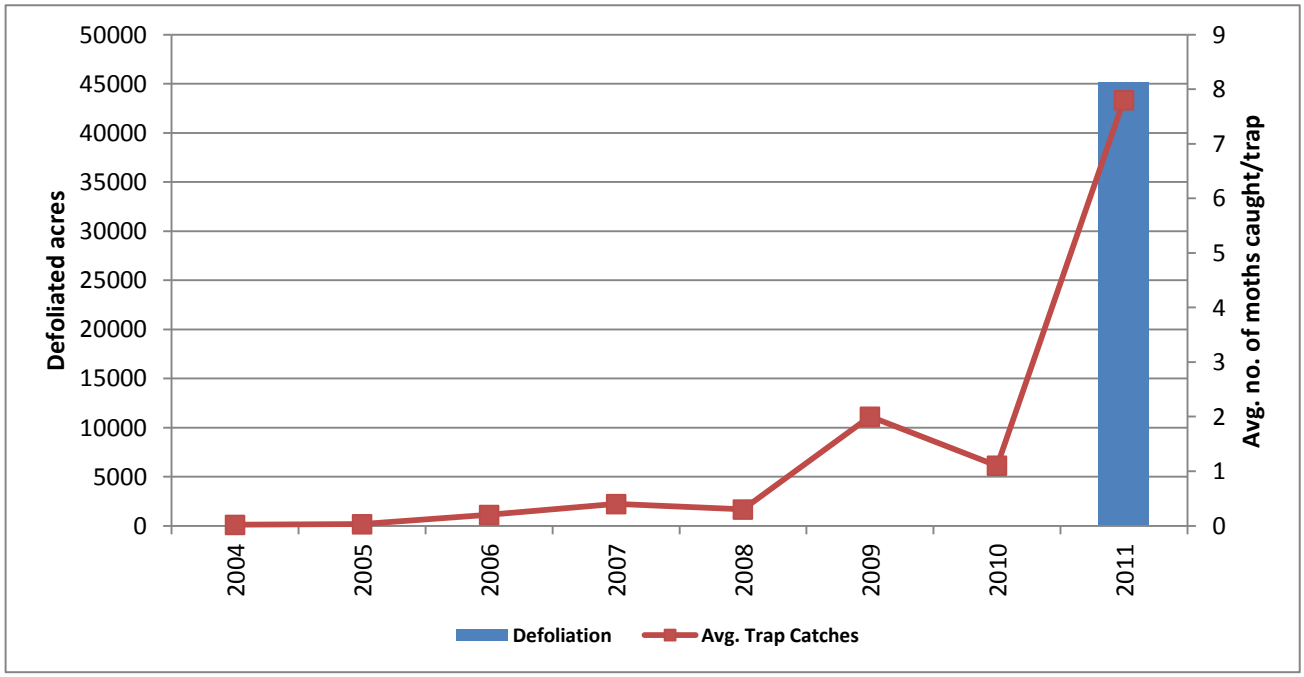


Figure. 1. Average DFTM adult trap catches and defoliated acres for the last 8 years within the trapping system area.

The following provides both legal descriptions and 2011 ADS map webpage links for areas of recorded defoliation. The webpage ADS maps do not provide township and range, only sections. A Forest map or similar map with township and range should be consulted initially to assist with legal descriptions. Defoliation was not detected on the Nez Perce Indian Reservation.

- **Clearwater NF** (1,050 acres)
  Forest Service lands:
  - west and south of Mineral Mountain (BM, T.43 N., R.4 W., sec. 18 &19)
  - northeast and southwest of Mission Mountain (BM, T.43 N., R.5 W., sec. 14 & 22).

  When referring to the link, please view the Palouse Reporting Area map:

  http://www.fs.usda.gov/detailfull/r1/forest-grasslandhealth/?cid=stelprdb5182972&width=full

- **Nez Perce NF** (38,000 acres)
  Forest Service lands:
  - Nearly all defoliated acres occurred to the north and west of Elk City (BM, T. 29, 30, 31, & 32 N., R.4,5,6, 7 &8 E., various sections). An estimated 75% of the defoliation is considered light. Depending on limiting factors such as weather, predators, parasitoids, and the nuclear polyhydrosis virus, visible defoliation is possible in this vicinity in 2012.

  When referring to the link, please view the Elk City Reporting Area map:

  http://www.fs.usda.gov/detailfull/r4/forest-grasslandhealth/?cid=stelprdb5182974&width=full

Other Federal lands in north Idaho not trapped by the Forest Service, but identified by ADS as having defoliation-caused DFTM:

- **Coeur d'Alene Indian Reservation** (5,450 acres)
  Forest Service lands within the Reservation:
  - Headwaters of Lolo Creek, just southwest of Lolo Pass (BM, T.44 N., R.5 W., sec. 32),
  - North of Charles Butte within the John Creek drainage (BM, T.44 N., R.3 W., sec. 21).

  Tribal lands:
  - Various sections in BM T. 43, 44, 45, 46, 47, 48 N.; R.3,4, and 5 W.

  When referring to the link, please view the Coeur d'Alene Indian Reservation Reporting Area map:

  http://www.fs.usda.gov/detailfull/r1/forest-grasslandhealth/?cid=stelprdb5182971&width=full

- **Coeur d'Alene NF** (650 acres)
  BLM lands:
  - BM, T.49 N., R.5 W., sec. 5,17,26, & 27.

  When referring to the link, please view the Coeur d'Alene Reporting Area map:

  http://www.fs.usda.gov/detailfull/r1/forest-grasslandhealth/?cid=stelprdb5182971&width=full

- **St. Joe NF** (35 acres)
  Forest Service lands:

- North of Charles Butte within the John Creek drainage (BM, T.44 N., R.3 W, sec. 21).

http://www.fs.usda.gov/detailfull/r4/forest-grasslandhealth/?cid=stelprdb5182975&width=full

In addition, a recent website developed by the Forest Health Technical Enterprise Team provides pest damage information for all Regions for the last five flight years:

http://www.foresthealth.info/portal/Flex/IDS

Conclusion

Douglas-fir tussock moth outbreaks typically last two to four years before natural controls cause the outbreaks to collapse. In north Idaho, an outbreak will usually cause two years of visible defoliation before it subsides. This is the first year of visible, recorded defoliation from this outbreak on the Clearwater and Nez Perce NFs. If this outbreak follows a typical two-year defoliation pattern, we would expect visible defoliation to occur again on the Clearwater and Nez Perce NFs for 2012. However, exact locations and acreage cannot be predicted.

Land managers should consult local entomologists to identify and prioritize areas where management objectives are most vulnerable to significant defoliation impacts. In areas where treatment applications may be considered to mitigate impacts, cocoon and/or larval sampling may be conducted in advance to estimate current DFTM populations (Brooks et al. 1978).

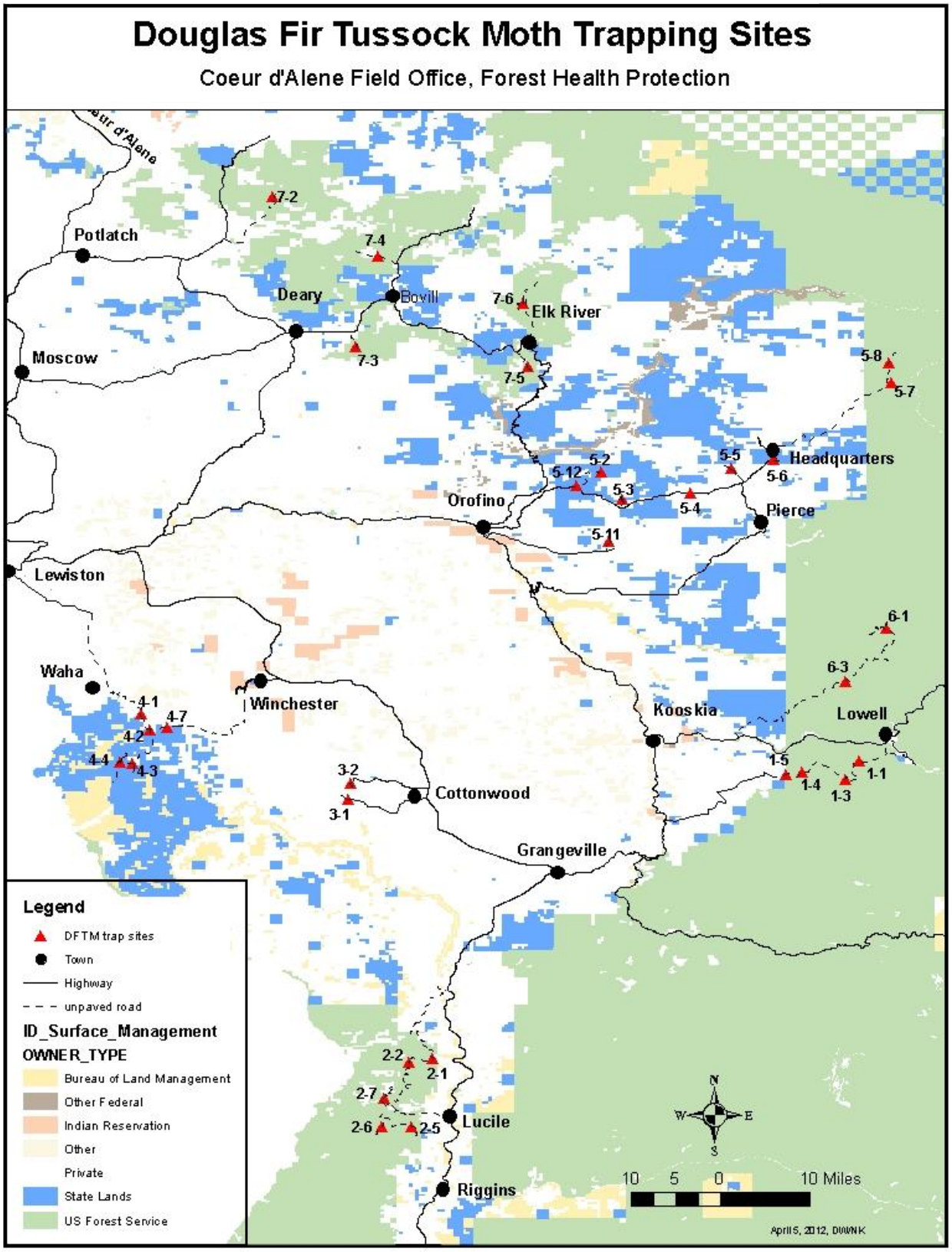
Literature Cited

Brooks, M., R. Stark, R. Campbell. 1978. The Douglas-Fir Tussock Moth: A Synthesis. Forest Service Science and Education Agency, U.S. Department of Agriculture, Washington, DC. Technical Bulletin 1585. 97-108pp.

Daterman, G.E., R.L. Livingston, J.M. Wenz, and L.L. Sower. 1979. How to Use Pheromone Traps to Determine Outbreak Potential. USDA Agriculture Handbook No. 546.11 p.

Sheehan, K.A. and I. Ragenovich. 2003. Douglas-fir tussock moth early warning system trapping summary for Oregon and Washington. 2002. USDA Forest Service, Pacific Northwest Region, Forest Health Protection & Air Management Group/Natural Resources. 8p.

Appendix 1. Forest Health Protection DFTM, EWS trapping sites.



Appendix 2. *Forest Health Protection DFTM, EWS trapping site locations.*

Site No	Plot Name	Type	Nearest Forest	Nearest District	County	Township	Range	Sec.	Moths Caught
3-1	Keuterville	Private	BLM - Coeur d'Alene Dist.	Cottonwood field office	Idaho	31N	1W	9	19
3-2	Cottonwood Butte	Private	BLM - Coeur d'Alene Dist.	Cottonwood field office	Idaho	32N	1W	33	2
4-3	Junction	State	ID Dept. of Lands	Craig Mtn Area	Nez Perce	32N	4W	22	5
4-7	No Name	State	ID Dept. of Lands	Craig Mtn Area	Nez Perce	33N	4W	36	23
4-4	Captain John Cr.	State	ID Dept. of Lands	Craig Mtn Area	Nez Perce	32N	4W	21	4
4-1	Lake Waha	USFS	Nez Perce IR	Lapwai	Nez Perce	33N	4W	23	9
4-2	Black Pine	USFS	Nez Perce IR	Lapwai	Nez Perce	33N	4W	36	17
5-6	Summit Landing	USFS	Clearwater NF	Pierce RD	Clearwater	38N	5E	35	3
5-7	Shin Point	USFS	Clearwater NF	Pierce RD	Clearwater	39N	7E	16	15
6-1	Canyon Junction	USFS	Clearwater NF	Lochsa RD	Idaho	34N	7E	5	66
5-8	Swanson Cr.	USFS	Clearwater NF	Pierce RD	Clearwater	39N	7E	5	12
5-2	Angel Butte	USFS	Clearwater NF	North Pierce RD	Clearwater	37N	3E	10	3
5-5	Bald Mountain	USFS	Clearwater NF	Pierce RD	Clearwater	37N	5E	5	52
5-4	Bargamin Creek	USFS	Clearwater NF	Pierce RD	Clearwater	37N	4E	23	70
5-3	Grangemont	USFS	Clearwater NF	Pierce RD	Clearwater	37N	3E	24	48
7-2	Little Bald Mtn.	USFS	Clearwater NF	Palouse RD	Latah	42N	2W	4	308
7-3	Little Boulder Creek	USFS	Clearwater NF	Palouse RD	Latah	40N	1W	28	39
7-4	W.Fork Potlatch R.	USFS	Clearwater NF	Palouse RD	Latah	41N	1W	2	43
7-5	Elk Creek Falls	USFS	Clearwater NF	Palouse RD	Clearwater	39N	2E	11	0
7-6	Morris Creek	USFS	Clearwater NF	Palouse RD	Clearwater	41N	2E	34	84
6-3	Mud Creek	USFS	Clearwater NF	Lochsa RD	Idaho	34N	6E	2	5
5-11	Cook Creek	USFS	Clearwater NF	Pierce RD	Clearwater	36N	3E	14	14
5-12	Whiskey Creek	USFS	Clearwater NF	Pierce RD	Clearwater	36N	3E	17	15
1-5	Big Tinker	USFS	Nez Perce NF	Selway RD	Idaho	32N	5E	25	23
1-4	Potato Hill	USFS	Nez Perce NF	Selway RD	Idaho	32N	6E	29	93
1-3	Pine Knob	USFS	Nez Perce NF	Selway RD	Idaho	32N	6E	26	209
2-2	Christie Creek	USFS	Nez Perce NF	Salmon River RD	Idaho	26N	1E	6	23
2-5	S. Fork Cow Cr	USFS	Nez Perce NF	Salmon River RD	Idaho	25N	1E	8	1
2-1	Rhett Creek	USFS	Nez Perce NF	Salmon River RD	Idaho	27N	1E	33	1
2-6	Springs Mountains	USFS	Nez Perce NF	Salmon River RD	Idaho	25N	1W	11	0
2-7	Crooks Corral	USFS	Nez Perce NF	Salmon River RD	Idaho	26N	1W	25	1

Appendix 3. Mean trap catch for Forest Health Protection - monitored plots from Potlatch to Lucille, ID, for the past 9 years.

Plot ID	Site Name	2011	2010	2009	2008	2007	2006	2005	2004	2003
1-1	Lodge Point	2.2	0.2	3.0	0.0‡	0.0	0.0	0.0	0.0	0.2
1-2	Goddard	*	*	*	*	*	*	*	0.0	*
1-3	Pine Knob	41.8	8.6	16.4	0.0‡	0.2	0.3	0.0	0.0	0.2
1-4	Potato Hill	18.6	0.4	1.4	0.0‡	0.0	0.0	0.0	0.0	0.0
1-5	Big Tinker	4.6	0.2	0.0	0.0‡	0.0	0.2	0.0	0.0	0.0
2-1	Rhett Cr.	0.2	0.0	0.0	0.33§	0.0	0.0	0.0	0.0	0.0
2.2	Christie Cr.	4.6	1.6	1.4	0.67§	0.0	0.0	0.0	0.0	0.0
2.3	Cow Cr. Saddle	*	*	*	*	*	*	*	0.0	*
2.4	Low Saddle	*	*	*	*	0.0	0.4	0.0	0.0	0.0
2.5	South Cow Cr.	0.2	0.8	1.4	0.0§	0.0	0.0	0.0	0.0	0.0
2.6	Spring Mtns.	0.0	0.0	1.4	0.0§	0.0	0.0	*	*	*
3.1	Keuterville	3.8	0.4	0.4	0.0§	0.0	0.0	0.0	0.0	0.0
3.2	Cottonwood Butte	0.4	1.2	0.4	0.0‡	0.0	0.0	0.0	0.0	0.0
4-1	Lake Waha	1.6	0.2	0.0	0.0§	0.0	0.0	0.0	0.2	0.0
4-2	Black Pine	3.4	0.0	4.0	1.25‡	0.2	0.0	0.0	0.0	*
4-3	Junction	1.0	0.6	0.8	0.0§	0.0	0.0	0.0	0.0	0.0
4-4	Captain John	0.8	0.8	1.0	0.33§	0.0	0.0	0.0	0.0	0.0
4-5	Webb Cr.	*	0.0	*	*	0.0	0.0	0.0	0.0	0.0
4-6	Forest	*	*	*	*	*	*	*	*	*
4-7	New Site (BLM)	4.6	1.2	9.4	0.0§	*	*	*	*	*
5-1	Johnson	*	*	*	*	*	0.0	0.0	0.0	0.0
5-2	Angel Butte	0.6	0.2	0.6	0.0	*	0.0	0.0	0.0	0.4
5-3	Grangemont	9.6	1.2	1.0	0.80	1.40	1.40	0.0	0.0	0.4
5-4	Bergamin Cr.	14.0	M	2.0	0.60	4.60	0.0	0.0	0.0	0.0
5-5	Bald Mtn.	10.4	1.2	1.6	0.20	3.4	1.8	0.0	0.0	0.2
5-6	Summit Landing	0.6	1.2	1.8	1.00	3.2	0.6	0.0	0.0	0.2
5-7	Shin Pt.	3.0	1.0	0.2	0.25	0.0	0.0	0.0	0.0	0.0
5-8	Swanson Cr.	2.4	0.8	0.8‡	.40	0.8	0.6	0.0	0.0	1.4
5-9	Skull Cr.	*	*	*	*	*	*	*	*	*
5-10	Cooper	*	*	*	*	0.0	0.0	0.0	0.0	0.0
5-11	Cook Cr. (new site 2009)	2.8	2.0	3.6	*	*	*	*	*	*
5-12	Whiskey Cr. (new Site 2009)	3.0	0.0	1.0	*	*	*	*	*	*
6-1	Canyon Junction	13.2	0.4	1.2	0.25‡	0.40	0.0	0.0	0.0	0.0
6-2	Fan Saddle	*	*	*	*	*	0.0	0.0	0.0	0.0
6-3	Mud Cr.	1.0	0.8	0.0‡	0.0	*	*	*	*	*
7-1	Laird Park	*	*	*	0.0	0.2	0.0	0.0	0.0	0.0
7-2	Little Bald Mtn.	61.6	1.4	3.6	*	0.0	0.0	0.0	0.0	0.2
7-3	Little Boulder Cr.	7.8	2.2	1.0	0.20	0.0	1.2	0.0	0.0	4.0
7-4	W. Fork Potlatch Rd.	8.6	2.0	1.2	0.80	0.0	0.8	0.6	0.0	2.4
7-5	Elk Cr. Falls	0.0	1.8	2.0	0.80	0.2	0.4	0.4	0.0	4.8
7-6	Morris Cr.	16.8	M	1.4	0.75	0.0	0.2	0.0	0.0	0.2
	Number of Sites Trapped	32	30	31	29	31	33	33	33	32
	Mean No. of Moths/Trap/Site	7.6	1.1	2.06	0.30	0.47	0.24	0.03	0.01	0.45

* Indicates sites not trapped
M Indicates missing in 2010
‡ Indicates 4 traps/site in 2008
§ Indicates 3 traps/site in 2008